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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,694	09/14/2006	Toshiaki Anzaki	44046.203.299.11	2048

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EXAMINER	
ROBINSON, LAUREN E	

ART UNIT	PAPER NUMBER
1794	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/560,694	ANZAKI ET AL.	
	Examiner	Art Unit	
	LAUREN ROBINSON	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 December 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/16/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being obvious over Finley (WO 2002/040417) in view of Yamazaki (US Pub. 2002/004291) as evidenced by Lumpkin ("Physical and Chemical…").

Regarding claims 1-2: Finley teaches a photo catalytic member (title, Figure 1) comprising a substrate, an undercoat layer formed on the substrate and a photo catalyst layer formed on the surface of the undercoat layer (Pg. 2, par. 6-7, Pg. 3, par. 5 and Pg. 4, par. 1-2). The reference teaches that the undercoat layer can be in the crystalline form (Pg. 8, par. 4). Further, the reference discloses that the crystalline undercoat layer can have a thickness of greater than 0A to 160A (greater than 0nm to 16nm) (Pg. 4, par. 1) for example, a thickness of 31A (3.1nm) can be used (Pg. 9, par. 13). Also, the thickness of the photo catalyst layer can be any desired thickness such as 100A (10nm) (Pg. 4, par. 4). Furthermore, Finley teaches that the above layers are applied to substrates that are transparent such as glass but that any type of glass substrate can be used (Pg. 3, par. 2) and that the crystalline undercoat is comprised of metal (Pg. 6, par. 6). Although the above teaching is disclosed, the reference *does not specifically*

disclose that a peel preventing layer whose main component is an oxide, oxynitride, or nitride of silicon or tin.

Yamazaki teaches a method of manufacturing a semiconductor device (title). The reference teaches that the device is comprised of a glass or a metal substrate (0081) with a semiconductor crystalline film formed thereon (abstract, 0099). The reference teaches that an insulating film of silicon oxide can be formed as a base layer directly onto the substrate in order to prevent any impurities going from the substrate into a metal film formed thereon as well as to enhance adherence between the substrate and a semiconductor film and prevent peeling. The reference discloses that if a heat resistant glass such as quartz is used as the substrate, an oxidized amorphous film can be used for the same purpose (0081).

Finley and Yamazaki are related due to both teaching a glass substrate with metallic films formed thereon. While Finley does not disclose the use of the taught glass substrate with photocatalytic coating for a semiconductor purpose, the examiner notes that it would be recognized by one of ordinary skill in the art that enhanced adherence and/or peeling prevention of coatings on a substrate would be advantageous as it is illustrated in Finley that the photocatalytic coating is ideally left on the substrate surface in order to impart the photocatalytic properties to said surface. Also, as discussed in Finley, the photocatalytic coating is crystallized and comprised of metal and the substrate is glass. From this it is the examiner's position that if one of ordinary skill in the art desired to prevent peeling of a crystallize metal layer to a glass substrate, they would look to the prior art and since Yamazaki et al. teach a glass substrate with a

crystallized metal film formed thereon, although for a different purpose and not necessarily the same metal, they would recognize that it would be obvious to try the silica base layer of Yamazaki et al. in between the crystallized metal layers and glass surface of Finley as it showed advantageous results for adhering a crystallized layer to glass in Yamazaki et al.. As such, it is the examiner's position that it would have been obvious to one of ordinary skill in the art at the time of invention to try and modify Finley to include the silicon oxide layer of Yamazaki et al. in between the glass substrate and the crystallized metal film in order to impart enhanced adherence of the crystallized layer to a glass surface and thereby prevent peeling of said layer **(Claims 1-2)**.

Regarding claim 3: Finley also teaches that the main component of the undercoat layer is a zirconium oxide (Pg. 4, par. 1, Pg. 6, par. 6) and that the photo catalyst layer is crystalline titanium oxide (Pg. 2, par. 6-7, Pg. 8, par. 4). However, Finley is *silent regarding the modified silicon oxide layer being that of an amorphous silicon oxide being the main component of the layer.*

While Finley does not specifically disclose the above limitation, as discussed above, Finley discloses that any type of substrate can be used depending on desired properties and as discussed in Yamazaki, if a heat resistant substrate is used such as quartz then the silicon oxide film can be an amorphous silicon oxide film. The examiner notes that while Finley does not disclose the same heat resistant substrate, one of ordinary skill in the art would recognize that a heat resistant substrate would be advantageous because the substrates disclosed in Finley can be used for windows of architectural building, and it would be recognized by one with ordinary skill that in case

of fire, etc., the property of being heat resistance would be ideal and since Finley does not limit the type of substrate used, one would recognize that any heat resistant substrate could be used.

Further, since it was recognized above that it would have been obvious to use the silicon oxide film of Yamazaki in the structure of Finley because both teach crystallized metal films coated onto a glass substrate, one would also recognize that a substrate/silicon oxide combination that has been deemed productive for the above purpose is that of a heat resistant quartz substrate with an amorphous silicon oxide base film formed thereon. Therefore, if one desired to have enhanced heat resistance and maintain the adherence between the crystallized metal layer and the heat resistant substrate, then one would recognize and find it obvious to use the substrate/base film combination of Yamazaki et al. in order to enhance heat resistance of the substrate to be used for building windows while still maintaining peel prevention and adherence between a crystallized metal film and a glass type substrate **(Claim 3)**.

Regarding claim 4: Finley also teaches that the zirconia can occur in the baddeleyite structure (Pg. 8, par. 4) and as evidenced by the title and abstract of Lumpkin, baddeleyite zirconia corresponds to monoclinic zirconia **(Claim 4)**.

Regarding claim 5: As Finley now modified discloses the above teaching, the reference *does not specifically teach the limitation of a dead layer which is observed as a halo pattern in an electron diffraction image not substantially being present between the undercoat and the photo catalyst layer.*

While this limitation is not disclosed, the examiner notes that Finley as modified now includes the same layers, thickness, and composition of said layers as the applicants. Also, the applicants disclose in paragraphs 0020-0022 that the photo catalyst layer and the undercoat crystalline layer being formed in the same manner as in Finley, such as the photo catalyst being on the surface of the crystallized zirconia undercoat, is what controls the formation of the dead layer. Therefore, it is the examiner's position that since the layers in Finley are the same and formed in the same manner within the structure as the applicants, then the limitation of a dead layer not being substantially present as claimed in claim 5 would be inherent **(Claim 5)**.

2. Claims 6-10 are rejected under 35 U.S.C. 103(a) as being obvious over Nakai et al. (JP-08-104547) in view of Finley (WO 2002/040417) in further view of Yamazaki (US Pub. 2002/004291).

While a direct human translation is forthcoming, using the English machine translation, Nakai et al. teach heat insulating glass comprised of double (multiple) pane glass members (0002, Figure. 2). The reference teaches that the double pane glass can be used for vehicle windows, etc. (0001). Also, as illustrated in Figure 2, the heat ray reflecting film is provided on the inner surface of a first glass sheet and this structure aids to insulate heat within a window (0001). While Nakai et al. disclose this teaching, they are *silent regarding the multiple glass having a layered structure comprising a peel preventing layer having the claim characteristic, a crystalline undercoat provide on the peel preventing layer with the applicants' characteristics and the photocatalyst layer formed with the applicants' characteristics formed on the undercoat. Also, the reference*

is silent regarding the heat ray film being provided on the taught glass sheet is specifically on the inner surface of an outdoor side glass sheet.

Consider the layered structure comprising a peel preventing layer having the claim characteristic, a crystalline undercoat provide on the peel preventing layer with the applicants' characteristics and the photocatalyst layer formed with the applicants' characteristics formed on the undercoat and the structure being formed on the out door side glass sheet

As discussed, Finley as modified teaches a glass substrate such as for an architectural window of a vehicular window (Pg. 1, par. 3) wherein a peel preventing layer is formed thereon wherein the layer contains as its main component silicon oxide. Also Finley teaches as discussed that the crystalline undercoat layer is provided over the peel preventing layer wherein the undercoat layer has a thickness of 1.5 and 16nm and a photocatalyst layer having a thickness of 10 nm is provided on the undercoat. Also, Finley includes that the undercoat layer can have a thickness of 38A (3.8 nm (Pg. 4, par. 9). Finley teaches that a layered structure such as this provides for improving the self cleaning properties to a surface (Pg. 1, par. 4).

Finley and Nakai et al. are related due to both teaching a glass substrate structure used for windows such as in a vehicle. While Nakai et al. does not disclose the above limitation, the examiner notes that one of ordinary skill in the art would recognize and find it obvious to one of ordinary skill to place a self cleaning layer on any surface, especially the glass surfaces taught in both references, due to it being known that glass windows such as the ones in vehicles are subjected to environmental contaminants.

Therefore, it is the examiner's position that if one desired to have a self cleaning property, they would look to the prior art to find said property on a glass window substrate and find the one taught by Finley to be advantageous since both references teach a window vehicle and Finley discloses that his taught structure is better over others.

Furthermore, the examiner notes that one of ordinary skill in the art would recognize that the self cleaning property would be useful on any glass surface but it is the examiner's position that one would recognize that an outside surface of an out door glass of a double pane vehicle window, for instance the surface exposed to the external environment, would be subjected to more contaminants than the indoor surfaces of the sheet. Therefore, it is the examiner's position that one of ordinary skill would have found it obvious to use a photocatalytic coating on the outer side of an outside sheet, thereby exposed to the external environment, in order to clean said surface.

Due to the above teaching, it is the examiner's belief that it would have been obvious to one of ordinary skill in the art at the time of invention to use any self cleaning property on the double paned glass, especially the one taught by Finley on an outer side of an outdoor side glass in the panel, in order to aid in decreasing contaminants on the vehicle window surfaces and impart a self cleaning property.

Consider the heat ray film being provided on the taught glass sheet is specifically on the inner surface of an outdoor side glass sheet

While Nakai et al. discloses the need to have the heat reflecting layer on the inner surface of any glass sheet in order to insulate the heat and have high transmission

but does not specifically disclose the above limitation of specifically what glass pane the heat ray reflecting film is adhered to the inner surface of, the examiner notes that the purpose of the heat ray reflecting film in Nakai et al. is to reflect any heat from infrared rays which is known in the art to occur from sunlight, etc.. Due to the film needed to reflect infrared rays and it is known in the art that it is ideal to block heat rays from inside a vehicle such as using tint, etc, it is the examiner's belief that one of ordinary skill in the art would recognize that it would be ideal to place the heat reflecting film on the glass sheet closest to the heat source, which is the outer glass sheet closest to the external environment around a vehicle, and further away from the indoor sheet as it would be closer to the source and in turn have more of a chance to reduce the rays in time before they travel to the inner side of the vehicle. As such, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Nakai et al. to include that it would be advantageous to at least try to coat the heat reflecting film on the indoor side surface of said outdoor side glass in order to aid in the reduction of heat rays and have more of a chance of reducing the rays before they reach the inner surface of the vehicle, thereby keeping the vehicle interior cool **(Claim 6)**.

Regarding claim 7: As discussed, Nakai et al. was modified to include the applicants' claimed peel preventing layer, crystalline undercoat, photocatalyst layer wherein the multilayered laminate is placed on the outdoor face of the outdoor side glass and that the heat reflecting film is placed on the indoor surface of the outdoor glass sheet. Also, since Nakai et al. was modified to include the laminate structure of Finley, then the teaching of Finley that the undercoat layer that is included can have a thickness of

3.8nm is now included in Nakai et al. However, the reference *does not specifically disclose that the photo catalyst layer that has a thickness of 10nm having a thickness of between 3 to 5nm.*

While Nakai et al. as modified does not include the above limitation, the examiner notes that the thickness of a layer is a result effective variable as it is known that by altering the thickness, the optical and/or physical properties will change. In the instant case, it would be known that if the thickness of the photo catalytic layer is increased or decreased, the photo catalytic properties will change and through routine experiment of optimizing the thickness, the desired properties can be obtain. As such, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Nakai et al. to include that the thickness of the photocatalytic layer can be optimized to any value, including the applicants' thickness, in order to obtain desirable photocatalytic results of the glass surface **(Claim 7)**.

Regarding claims 8-9: Nakai et al. as modified now includes the layers and the laminate modified photo catalyst laminate structure of Finley. Therefore, Nakai et al. as modified includes that the peel preventing layer is comprised of amorphous silicon oxide, the undercoat is comprised of zirconium oxide which as discussed above, is monoclinic, as the photocatalyst layer can be a crystalline titanium oxide compound. Further, Nakai et al. teach that the heat reflecting film therein can be comprised of a laminate of dielectric (metal oxide)/ Ag/ dielectric (metal oxide)/ Ag/ dielectric (metal oxide) wherein the dielectric oxides are zinc oxide (Nakai, 0020 and Figure 1) **(Claims 8-9)**.

Regarding claim 10: Also, since Nakai et al. now includes the laminate photocatalytic structure wherein the same undercoat layer with the same photocatalyst layer formed thereon is the same in the reference as modified as the applicants disclosure for the same reasons as discussed prior, then it is the examiner's position that the limitation of claim 10 will be inherent **(Claim 10)**.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to

be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1 and 2 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 2 and 4 of copending Application No. 11/758360. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the present application broadly incorporate the invention of the present claims 2 and 4 of the copending application and, the additional limitations within the copending application would have been obvious to one of ordinary skill in the art at the time of invention.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAUREN ROBINSON whose telephone number is (571)270-3474. The examiner can normally be reached on Monday to Thursday 6am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-2721284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Lauren E. T. Robinson
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